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NOTICE OF DECISION TO TAKE ACTION ON PROPOSED REGULATIONS

In accordance with the provisions of § 4-168(e) of the Connecticut General Statutes, the Department of Energy and Environmental Protection (DEEP/departments) hereby gives notice that it has decided to proceed with the adoption of proposed regulations concerning Dam Safety Inspection and emergency Action Plans. A Notice of Intent to Adopt these regulations was posted on the Secretary of the State's web page for e-Regulations on February 24, 2015.

DEEP held a public hearing on April 7, 2014 to receive comment on the proposal. DEEP proposes to revise, adopt and repeal the sections as noticed and after revision in accordance with the recommendations of the Hearing Officer. The final wording of the proposal and the Hearing Officer's report are available for inspection and copying as described below. The Hearing Officer's report includes:

- (A) A statement of the principal reasons in support of this intended action;
- (B) A statement of the principal considerations in opposition to this intended action; and
- (C) A statement of the agency's reasons for accepting or rejecting such considerations.

The Hearing Officer's report and final wording of the proposal are available on-line via the DEEP Website at www.ct.gov/deep/dams.

In addition, the final wording of the proposal and Hearing Officer's report may be obtained by contacting the following staff person:

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IMPORTANT: Use this form (REGS-1) to submit permanent regulations to the Legislative Regulation Review Committee.
For emergency regulations, use form REGS-1-E instead.
For non-substantive technical amendments and repeals proposed without prior notice or hearing as permitted by subsection (g) of CGS 4-168, as amended by PA 13-247 and PA 13-274, use form REGS-1-T instead.

Please read the additional instructions on the back of the last page (Certification Page) before completing this form. Failure to comply with the instructions may cause disapproval of proposed regulations.

State of Connecticut
REGULATION
of the

NAME OF AGENCY:

Connecticut Department of Energy and Environmental Protection

Concerning

SUBJECT MATTER OF REGULATION:

Dams and Similar Structures

SECTION 1.

Section 22a-409-1 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 22a-409-1. Definitions. Registration of dams and similar structures

(a) **Definitions.** As used in Sections 22a-409-1 and 22a-409-2:

(1) "Abutment" means natural ground that borders on either end of the dam structure.

(2) "Acre-foot" means a unit of volume of water equal to 43,560 cubic feet or 325,853 gallons (one foot depth over one acre).

[(3)] (3) "Average daily traffic" (ADT) means a measure of the number of vehicles using a specific road in an average twenty-four hour period.]

[(4)] (3) "Appurtenance" means any structure or mechanism other than the dam itself which is associated with its operation.

(4) "Arterial roadway" means a roadway that provides a high level of mobility frequently the route of choice for buses and trucks as provided in the U.S. Department of Transportation

document entitled “Highway Functional Classification Concepts, Criteria and Procedures, 2013 edition”.

- (5) "Breach" means an alteration of a dam either deliberately or accidentally in such a way as to release its impounded waters resulting in partial or total failure of the dam.
- (6) “Collector roadway” means a roadway that collects traffic from local roadways and connects traffic to arterial roadways, as provided in the U.S. Department of Transportation document entitled “Highway Functional Classification Concepts, Criteria and Procedures, 2013 edition”.
- [(6)] (7) "Commissioner" means the [commissioner] Commissioner of Energy and [e] Environmental [p] Protection, or such commissioner’s designated representative.
- (8) “Certificate of Dam Registration” or “(CDR)” means a form issued by the commissioner to the owner that acknowledges receipt of all required information regarding a dam registration and a one-time payment of the registration fee.
- (9) “CT Dam ID Number” means a unique identifying number assigned to a dam registered and regulated by the State of Connecticut.
- [(7)](10) "Dam" means any barrier of any kind whatsoever which is capable of impounding or controlling the flow of water, including but not limited to storm water retention or detention dams, flood control structures, dikes, and incompletely breached dams.
- (11) “Dam failure” has the same meaning as “dam failure” as provided in section 22a-411a-1 of the Regulations of Connecticut State Agencies (RCSA).
- [(8)](12) "Dam [Height] height" means the vertical distance from the crest of the dam or similar structure to the downstream toe of such dam or similar structure.
- [(9)](13) "Embankment" means the fill material, usually earth or rock, placed with sloping sides providing a barrier which impounds water.
- [(10)] (14) "Flood" means [a general and temporary condition of partial or complete inundation of normally dry land areas] any high flow, overflow, or inundation by water which causes or threatens damage to persons or property.
- [(11)] (15) "Hazard [Potential] potential" means the probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage.
- (16) “Local roadway” means a roadway that provides a high level of accessibility used to provide direct access to multiple properties as provided in the U.S. Department of Transportation document entitled “Highway Functional Classification Concepts, Criteria and Procedures, 2013 edition”.

(17) "Operator" means the person(s) in control of, or having responsibility for, the daily operation of the dam as designated by the owner on the dam registration form required by subsection (b) of this section.

[(12)] (18) "Owner" means [any individual, firm, partnership, association, syndicate, company, trust, corporation, municipality, agency, or political or administrative subdivision of the state, or any other legal entity of any kind holding legal title to the dam] the person(s) having legal ownership of the dam.

(19) "Person" has the same meaning as "person" as provided in section 22a-2(b) of the Connecticut General Statutes.

(20) "Professional engineer" means an individual who is currently licensed and registered under section 20-302 of the Connecticut General Statutes.

(21) "Regulated dam" means a dam subject to jurisdiction under the Department of Energy and Environmental Protection pursuant to section 22a-401 of the Connecticut General Statutes.

(22) "Regulatory inspection" means an inspection required in accordance with section 22a-409(c) of the Connecticut General Statutes and section 22a-409-2(c) of the Regulations of Connecticut State Agencies.

(23) "Spillway design flood" or "SDF" means the largest flood that a given structure is designed to pass safely.

[(13)](24) "Structure" means the dam, its appurtenances, abutments and foundation.

[(14)](25) "Toe" means the base portion of the impounding structure which intersects with natural ground at the upstream and downstream sides.

(26) "100-year flood" means a statistical designation that there is a 1 in 100 chance that a flood of this intensity will occur at a particular geographical location during any year.

(b) **Registration.** The owner of any dam or similar structure required to be registered by section 22a-409(b) of the Connecticut General Statutes and that is not already registered shall register any such dam or similar structure with the commissioner on or before [July 1, 1984], October 1, 2015, [on] All registrations shall be submitted on a form prescribed by [him] the commissioner [the location and dimensions of such dam or structure. In addition the registration shall include] and shall provide the following:

(1) the name, address, [and] telephone number, and email address of the dam owner and operator;

(2) the name of the dam and impoundment and the CT Dam ID Number, if known;

(3) the street address of the dam location or the street address nearest to the dam location;

- (4) the parcel ID number of the property where the dam is located, i.e. map, block, and lot number, or as otherwise designated by the town;
[(3)] (5) the present condition of the dam;
[(4)](6) whether there is a low-level outlet, and whether the low-level outlet is operable;
[(5)](7) a map showing the location of the dam in context to surrounding streets;
[(6)](8) a description of the materials used in constructing the dam;
[(7)](9) the dimensions of the impoundment;
[(8)](10) the dimensions of the spillway;
[(9) a general description of the level of development in the floodplain below the dam:]
[(10)] (11) a statement of the use(s) of the impounded water;
[(11) whether the dam is regulated under the Connecticut Water Diversion Policy Act;]
(12) a check or money order payable to the [DEP, Water Resources Unit] DEEP Dam Safety Program for the amount of the registration fee [by] in accordance with section 22a-409(b) of the General Statutes, as amended;and
(13) any other relevant information which the commissioner deems necessary.
- (c) **Changes in registration information.** The owner shall report any change in the following information provided in the registration to the commissioner [within] not later than ten (10) days from the date of such change:
(1) The name, address, [and] telephone number, and email address of the dam owner or operator; or
(2) The name of the dam or its impoundment [;].
[(3) The present condition of the dam; or]
[(4) The condition of the low level outlet.]
- (d) **Certificate of Dam Registration (CDR).** [A registration form shall not be deemed received by the commissioner until all information specifically required by statute or regulation is submitted with the appropriate fee.] Upon review of a complete registration, the commissioner shall issue a [certificate of registration] Certificate of Dam Registration (CDR) to the owner of the dam. A registration form shall not be deemed complete by the commissioner until all information specifically required by statute or regulation is submitted with the appropriate fee.
- (e) **Fees.** (1) The commissioner shall waive the registration fee for any dam which is owned by the State of Connecticut [or the federal government].

(2) Wherever [a single] an impoundment is formed by two or more dams, there shall be a single registration fee based on the highest dam forming the impoundment.

(3) Wherever a dam is owned by two or more owners there shall be a single registration fee.
- (f) **Forfeiture and Injunction.** Failure to register a dam not previously registered, by [July 1, 1984] October 1, 2015 shall subject the owner of the dam to the forfeiture and injunction provisions of [Section] section 22a-407 of the Connecticut General Statutes, as amended.

- (g) **Violations.** Any violation of these regulations shall subject the owner of the dam to the injunction provisions of [Section] section 22a-6(3) of the Connecticut General Statutes, as amended, or an administrative civil penalty pursuant to sections 22a-6b-1 to 22a-6b-15 of the Regulations of Connecticut State Agencies or both.

SECTION 2.

Section 22a-409-2 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 22a-409-2. Dam safety inspection [regulations] and classification

- (a) **Jurisdiction.** All dams which must be registered pursuant to Section 22a-409 of the General Statutes shall be under the jurisdiction of the Commissioner. Dams of the State, or any political subdivision thereof, and all dams within the State except those of the United States or its instrumentalities are included within the jurisdiction conferred by this section.]

Classification of Dams.

- (1) The commissioner shall assign each dam to one of five classes according to the potential impacts of a dam failure. The factors used to evaluate and assign a hazard potential are the physical characteristics of the dam, such as the dam height and capacity of the impoundment, the location of the dam, the areas impacted by a failure of the dam, and potential damage to property, infrastructure, or threat to human life as described below:

- (A) A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:

- (i) no measurable damage to roadways;
- (ii) no measurable damage to land and structures; and
- (iii) negligible economic loss.

- (B) A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:

- (i) damage to agricultural land;
- (ii) damage to unpaved local roadways;
- (iii) minimal economic loss.

- (C) A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:

- (i) damage to normally unoccupied storage structures;
- (ii) damage to paved local roadways;
- (iii) moderate economic loss.

(D) A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:

- (i) possible loss of life;
- (ii) minor damage to habitable structures, residences, including but not limited to industrial or commercial buildings, hospitals, convalescent homes, or schools;
- (iii) damage to local utility facilities including water supply, sewage treatment, fuel, power, cable or telephone infrastructure, causing localized interruption of these services;
- (iv) damage to collector roadways and railroads;
- (v) significant economic loss.

(E) A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:

- (i) probable loss of life;
- (ii) major damage to habitable structures, residences, including but not limited to industrial or commercial buildings, hospitals, convalescent homes, or schools;
- (iii) damage to major utility facilities including public water supply, sewage treatment plants, fuel storage facilities, power plants, or electrical substations causing widespread interruption of these services;
- (iv) damage to arterial roadways;
- (v) great economic loss.

(2) The classification of a Class A, BB, B, and C dam shall be reviewed during each regulatory inspection.

- (3) Dams shall be subject to reclassification at any time the commissioner determines that the hazard potential of the dam has changed.
- (4) The dam owner may submit a request to change the hazard classification assigned to the owner's dam based on an analysis submitted to the commissioner that supports the reclassification. Recommendations made by the owner to reclassify the owner's dam shall be subject to review and approval by the commissioner.
- (5) Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of this dam shall be at least as great as that of the downstream dam.
- (6) Potential damage to habitable structures will be considered minor when habitable structures are not within the direct path of the probable flood wave produced upon failure of a dam and when such structures will experience:
 - (A) No more than 1.5 feet of rise of flood water above the lowest ground elevation adjacent to the outside foundation walls; or
 - (B) No more than 1.5 feet of rise of flood water above the lowest habitable floor elevation of the structure; the lower of the elevations governing.

(b) **[Periodic] Regulatory Inspections - Applicability.** [The following dams shall be regularly inspected by the Department of Environmental Protection at a frequency as described in Section 22a-409-2(e)(2) of these regulations] The owner of a dam classified by the commissioner as Class C, B, BB, or A in accordance with subsection (a) of this section shall ensure a regulatory inspection is conducted for such dam in accordance with the requirements of this section except dams owned or regulated by the United States or its instrumentalities that are visually inspected on a regular basis in accordance with applicable federal requirements to the satisfaction of the commissioner:

- (1) If the commissioner determines that a dam classified as AA poses a unique hazard, the commissioner may require its owner to conduct a regulatory inspection in accordance with this section except dams owned or regulated by the United States or its instrumentalities that are visually inspected on a regular basis in accordance with applicable federal requirements to the satisfaction of the commissioner.
- (2) All dam owners of the state or any political subdivision of the state shall be required to conduct a regulatory inspection.

[(1) Dams which pose a significant (B) or high (C) hazard to life or property as defined in Section 22a-409-2(d);

(2) Dams which are:

- (A) Greater than twenty-five (25) feet in height with an impoundment capacity greater than fifteen (15) acre-feet; or
 - (B) Greater than six (6) feet in height but less than or equal to twenty-five (25) feet in height with an impoundment capacity greater than fifty (50) acre-feet; or
 - (3) All other dams with an impoundment capacity of three (3) acre-feet or more.]
- (c) **[Periodic] Regulatory Inspection Procedures. All regulatory inspections must be conducted by a professional engineer and use a standard dam inspection form and instructions that direct the proper use of the form. Both the inspection form and the instructions will be developed by the commissioner and based upon accepted standards of visual dam inspection.**
- (1) Each [periodic] regulatory inspection shall consist of, but not be limited to, the following:
- (A) Visual inspection of the dam, its appurtenances, abutments, downstream toe and all other areas which could affect the safety of the dam. In addition, inspection and operation of mechanical systems, and inspection of the abutments downstream, the components of the dam which are under water during normal operation, or the interior of outlet conduits shall be made [by the owner, if required by the Commissioner] if deemed necessary by a professional engineer to more completely assess the condition of the dam;
 - (B) Review [and analysis] of all available file data [on] related to the design, construction, post construction investigations, operation, maintenance and performance of the structure. This review will supplement the visual inspection and aid in determining if additional analysis is required;
 - (C) Observation of the nature and extent of downstream development which would be subject to inundation in the event of a dam breach for purposes of assessing the potential hazard which the dam poses;
 - [(D) Evaluation of the general condition of the structure, including when possible, assessment of its hydrologic and its hydraulic capabilities and structural stability.]
 - [(E)] (D) Evaluation of the operation, maintenance and inspection procedures employed by the owner [.]; and
 - [(F)] (E) Evaluation of any other conditions which constitute or could constitute a hazard to the integrity of the structure.

[(2)] The inspection shall be performed by qualified personnel of the D.E.P. Dam Safety Program with technical training in the inspection of dams and under the supervision of a civil engineer.]

[(3)](2) [A standard dam inspection checklist based upon accepted standards of visual dam inspection and inspection guidelines which direct the proper use of the checklist shall be prepared by the Commissioner and will be utilized by the inspection team.] The professional engineer, shall prepare a written report using a form prescribed by the commissioner detailing the findings of the regulatory inspection which shall include, but not be limited to, the following:

(A) An assessment of the condition of the structure based on the visual observations, available file data [on] related to the design, construction, post construction investigations, operation, maintenance and performance of the [structure, the hydrologic and hydraulic capacities and the structural stability] dam[;] and

(B) Recommendations [for any emergency measures or actions, if required to assure the immediate safety of the structure], if any are required as a result of the inspection and assessment, for:

(i) emergency measures or actions, if required to assure the immediate safety of the structure;

[(C)](ii) [Recommendations for] remedial measures and actions related to design, construction, operation, maintenance and inspection of the structure [, if required];

[D] (iii) [Recommendations for] additional detailed studies, investigations and analyses [, if required; and];

[E] (iv) [Recommendations for] time periods appropriate for implementing [any necessary emergency, remedial measures and] the actions [and any necessary additional investigations and analyses, as required by] recommended in accordance with [subparagraph (B), (C) and (D)] clauses (i), (ii), and (iii) of this [subdivision] subparagraph; [and]

[F] (v) routine maintenance and inspection by the owner, [if required.];

(vi) a hydrologic and hydraulic analysis based on file data, visual observations, or information provided by the owner that indicates the capacity of the spillway is insufficient to safely pass the spillway design flood or at a minimum the 100-year flood, if required; and

(vii) a stability analysis based on file data, visual observations, or information provided by the owner that indicates the stability of the dam may be structurally unsound under normal and extreme loading conditions.

[(4)] (3) The [Commissioner] owner shall furnish a copy of the written report to the [owner] commissioner not later than 30 days from the date he or she receives the report, but no later than March 15th of the year following the year the owner received the notification letter sent by the commissioner in accordance with section 22a-409(c) of the Connecticut General Statutes.

(A) [The owner shall within] Not later than thirty (30) days of receipt of [the written report] a written request from the commissioner to perform recommended maintenance or repairs on the dam, the owner shall inform the [Commissioner] commissioner in writing of [his or her] the owner's schedule of implementation of any required recommendations. The commissioner's recommendations shall be based on the commissioner's review of the submitted inspection report and recommendations made by the owner's professional engineer contained in the report; and

(B) A copy of the report will be kept on file with the records of the [Commissioner] commissioner pertaining to dam safety.

[(d) Classification of Dams.

(1) The Commissioner shall assign each dam to one of five classes according to [its hazard potential. Such classification shall be determined by the Commissioner during the initial periodic inspection.

(A) A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in any of the following:

- (i) no measurable damage to roadways;
- (ii) no measurable damage to land and structures;
- (iii) negligible economic loss.

(B) A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:

- (i) damage to agricultural land;
- (ii) damage to unimproved roadways (less than 100 ADT);
- (iii) minimal economic loss.

(C) A Class BB dam is a moderate hazard potential dam which, if it were to fail,

would result in any of the following:

- (i) damage to normally unoccupied storage structures;
- (ii) damage to low volume roadways (less than 500 ADT);
- (iii) moderate economic loss.

(D) A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:

- (i) possible loss of life;
- (ii) minor damage to habitable structures, residences hospitals, convalescent homes, schools , etc;
- (iii) damage to or interruption of the use or service of utilities;
- (iv) damage to primary (less than 1500 ADT) and railroads;
- (v) significant economic loss.

(E) A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:

- (i) probable loss of life;
- (ii) major damage to habitable structures, residences, , hospitals, convalescent homes, schools, etc.;
- (iii) damage to main highways (greater than 1500 ADT);
- (iv) great economic loss.

(2) The classification of a Class A, BB, B, and C dam shall be reviewed during each subsequent periodic inspection.

(3) All dams will be subject to reclassification at any time the Commissioner determines that the hazard potential has changed.

(4) Potential future development of the area downstream from the dam that would be affected by its failure shall be considered in determining the classification.

(5) Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of this dam shall be at least as great as that of the downstream dam.

- (6) Potential damage to habitable structures will be considered minor when habitable structures are not within the direct path of the probable flood wave produced upon failure of a dam and when such structures will experience:
 - (A) No more than 1.5 feet of rise of flood water above the lowest ground elevation adjacent to the outside foundation walls; or
 - (B) No more than 1.5 feet of rise of flood water above the lowest habitable floor elevation of the structure; the lower of the elevations governing.
- (7) The extent of potential damage resulting from a dam breach may notwithstanding the above, justify designating damage as either major or minor. Such a designation may be made after a detailed analysis has established the relative impact of the probable dam breach and has considered the following factors:
 - (A) The conditions prior to and after a dam breach;
 - (B) The extent to which, access has been affected, both before and after a dam breach;
 - (B) The extent of damage.]

[(e) Inspection Schedule.

- (1) The Commissioner or his representative may enter upon private property at any time to investigate or inspect any dam.
- (2) The Commissioner shall periodically inspect all dams in accordance with the following schedule. These time periods are the maximum time between inspections, more frequent inspections may be performed at the discretion of the Commissioner.

<i>Hazard Class</i>	<i>Inspection Frequency</i>
Class A (low)	10 years
Class BB (moderate)	7 years
Class B (significant)	5 years
Class C (high)	2 years
- (3) Inspections scheduled according to the time period set forth above, may be modified, at the discretion of the Commissioner, in special cases where it is desirable to observe a dam under particular conditions (i.e. wet season, dry season, foliage. . .).
- (4) The Commissioner may require scheduled inspections on a more frequent basis if particular conditions exist which require more frequent monitoring.
- (5) The Commissioner may require Class B and C dams to be inspected after the occurrence of a major flood event. The date of these post-flood inspections will be the starting date from which the date of the next regularly scheduled periodic inspection will be computed.
- (6) The Commissioner shall exempt from periodic inspections, any dam which,

after an initial inspection, impounds less than three (3) acre-feet of water or any Class AA dam, unless the Commissioner determines that such dam poses a unique hazard.])

[(f)] (e) Inspection [by the Owner] Schedule.

- [(1)] A dam owner [may elect to employ the services of a professional engineer registered in the State of Connecticut, experienced in the design, construction and inspection of dams to inspect the owner's dam] shall ensure a regulatory inspection is conducted as required by section 22a-409-2(b) of the Regulations of Connecticut State Agencies according to the following inspection schedule:

<i>Hazard Class</i>	<i>Inspection Schedule</i>
Class A (low)	<u>every</u> 10 years
Class BB (moderate)	<u>every</u> 7 years
Class B (significant)	<u>every</u> 5 years
Class C (high)	<u>every</u> 2 years

- [(2)] The owner shall furnish a copy of each completed inspection report in a format determined by the Commissioner within thirty (30) days of the date of the inspection to the DEP Dam Safety Program.
- (3) The inspection report shall be sealed by a professional engineer registered in the State of Connecticut and shall include:
- (A) Those items listed in Section 22a-409-2(c), and
 - (B) Correspondence from the owner stating his or her intent to implement such recommendations, if required.
- (4) If the dam owner elects to comply with subdivisions (1) through (3), inclusive, the Commissioner shall periodically inspect the dam according to the following schedule:

<i>Hazard Class</i>	<i>Inspection Frequency</i>
Class A (low)	20 years
Class BB (moderate)	14 years
Class B (significant)	10 years
Class C (high)	6 years

The year the Commissioner inspects the dam, the owner shall be exempt from conducting his or her own inspection.]

[(g) New Dam Construction.

- (1) All new dams, and dams which have a high or significant hazard classification undergoing substantial repairs according to the permit authorization of the Commissioner, must be inspected by the professional engineer employed by the dam owner for construction services according to the following schedule:
 - (A) Upon first filling of the impoundment, after completion of new construction or substantial repairs, inspection should be performed to assure proper functioning of dam components.
 - (B) Upon attainment of full impoundment, inspections of the dam should be performed frequently for the first two (2) months.
 - (C) These dams shall be inspected at least annually for the first three (3) years of operation.
 - (D) After the third year of operation, these dams will be inspected according to the inspection schedule set forth in Section 22a-409-2-(e).
 - (E) The Commissioner may exempt from the requirements of this subsection repairs to high and significant hazard dams which he determines do not affect the immediate safety of the dam.
- (2) An inspection report must be submitted by the owner's engineer to the Commissioner on a form prescribed by him, within thirty (30) days after:
 - (A) The last inspection performed during the first two (2) months after full impoundment was attained; and
 - (B) Each annual inspection as set forth in Section 22a-409-2(g)1(C).]

[(h)] (f) Fees for Inspection by the State.

- (1) [Each owner shall pay an inspection fee to cover the cost to the State of making both scheduled inspections and post-flood inspections within thirty (30) days after receipt by the owner. Such fee bill shall accompany the written report and shall be paid within thirty (30) days after receipt by the owner.] In the event the commissioner conducts a regulatory inspection of an owner's dam because that owner failed to do so as required by subsection (b) of this section, the owner shall pay an inspection fee to cover the cost to the State for conducting the regulatory

inspection. [Such fee bill shall accompany the written report and] Any invoice for such fee shall be paid in accordance with the instructions on the invoice.

[(2)] The owner shall submit the inspection fee by check, or money order payable to DEP Dam Safety Program.]

[(3)] (2) The fee for each regulatory inspection made by the State of an owner's dam shall be [according to the following:] \$3000.00.

[Hazard Class	Fee
Class A (low)	\$150.00
Class BB (moderate)	\$150.00
Class B (significant)	\$250.00
Class C (high)	\$350.00]

[(4)] (3) The [Commissioner] commissioner shall waive the regulatory inspection fee for any dam which is owned by the State of Connecticut.

[(i)] Notification.

- (1) The Commissioner shall notify a dam owner, of the upcoming date for a regularly scheduled inspection at least ninety (90) days before the inspection.
- (2) If, the Commissioner does not receive notification of the owner's intent to perform the inspection with his or her own engineer thirty (30) days prior to the date of the scheduled inspection, the Commissioner shall inspect the dam and charge the owner the appropriate fee.
- (3) If after notification by the owner of his or her intent to perform the inspection, the Commissioner does not receive a copy of the inspection report within thirty (30) days of the scheduled inspection date, the Commissioner shall inspect the dam and charge the owner the appropriate fee.]

[(j)] (g) Responsibility of the Owner.

- (1) [Inspections by the State do not relieve] The requirement to ensure a regulatory inspection is conducted by a professional engineer does not relieve an owner of [the] a dam of [the] other legal duties, obligations or liabilities incidental to the ownership or operation of [the] a dam.
- (2) [The] In addition to the regulatory inspections required by this section, the owner or [his or her representative] operator shall inspect the dam on a [frequent] regular basis to assure that no unsafe conditions are developing including but not limited to, weather related damage, animal activity or vandalism. Class B and Class C dams shall be inspected by the owner or [his or her representative] operator at least quarterly. Class BB dams shall be inspected by the owner or operator at least

annually. Class A dams shall be inspected by the owner or operator at least every two years. [and a] A written record of said inspections shall be maintained by the owner or operator and be made available to the [Commissioner] commissioner upon request.

- (3) The owner or [his or her representative] operator shall inspect the dam during and after the occurrence of major flood events to assure that the structure is withstanding the flood waters safely.
- (4) The owner or operator shall fully and promptly advise the [Commissioner] commissioner of any sudden or unpredicted floods, unusual circumstances or major changes in the condition of the dam.
- (5) The owner or operator shall report to the [Commissioner] commissioner any major damage which the dam suffered, such as overtopping by flood waters, erosion of the spillway discharge channel and any major problems which are observed to have developed such as new seepage or a significant increase in seepage quantities, settling, cracking or movement of the embankment or any component of the dam.
- (6) To facilitate visual inspection during the intervals between [regularly scheduled] regulatory inspections, the dam owner shall be required to maintain the structure and adjacent area free of brush and tree growth.
 - (A) Brush and tree growth shall be cleared from embankments and within twenty-five (25) feet of the upstream and downstream toe and the abutment embankment contact; and
 - (B) Grass [or other suitable vegetative cover] on earthen embankment dams must be established and maintained [on abutments and embankments].
- (7) The owner shall maintain a written record of all inspections and maintenance work performed. This record shall include observations made regarding areas of concern on the structure and descriptions of the major and minor repairs performed and materials utilized.

(h) Inspection by the Commissioner.

- (1) The commissioner may enter upon private property at any time to investigate or inspect any dam for any reason, including but not limited to the following: the auditing of regulatory inspection reports, failure of the owner to conduct a regulatory inspection, to investigate a complaint, or as determined necessary after a flood event.

- (2) Any inspection conducted by the Commissioner in accordance with this subsection, including a regulatory inspection, shall be performed by a professional engineer or personnel of the DEEP Dam Safety Program with technical training in the inspection of dams and under the supervision of a professional engineer.

SECTION 3.

The Regulations of Connecticut State Agencies are amended by adopting section 22a-411a-1 as follows:

(NEW) Sec. 22a-411a-1. Definitions.

Definitions. As used in section 22a-411a-2 of the Regulations of Connecticut State Agencies:

- (1) "Abutment" has the same meaning as "abutment" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.
- (2) "Appurtenance" has the same meaning as "appurtenance" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.
- (3) "Breach" has the same meaning as "breach" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.
- (4) "Commissioner" means the Commissioner of Energy and Environmental Protection, or such commissioner's designated representative.
- (5) "Class B Dam" means significant hazard potential dam as provided for in section 22a-409-2(a) of the Regulations of Connecticut State Agencies.
- (6) "Class C Dam" means a high hazard potential dam as provided for in section 22a-409-2(a) of the Regulations of Connecticut State Agencies.
- (7) "Dam" has the same meaning as "dam" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.
- (8) "Dam failure" means a catastrophic breach characterized by the sudden, rapid, and uncontrolled release of impounded water, or a lesser breach that adversely affects the dam's primary function of impounding water.
- (10) "Embankment" has the same meaning as "embankment" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.
- (11) "Early Warning Notification" means an alert stage in which the local authorities are informed by the dam owner that a situation exists at a dam that could develop into a serious hazard to downstream inhabitants, making evacuation necessary.

(12) “Emergency” means a condition of a serious nature which develops unexpectedly, endangers the structural integrity of a Class C or Class B dam, and requires immediate action.

(13) “Emergency Action Plan” or “EAP” means a formal document required to be submitted to the commissioner in accordance with section 22a-411a-2 of the Regulations of Connecticut State Agencies.

(14) “Emergency management authority” means any local, state, federal, or tribal agency responsible for emergency operations, planning, mitigation, preparedness, response, and recovery for all hazards.

(15) “Emergency Operation Center” means the location or facility where responsible officials gather during an emergency to direct and coordinate emergency operations, to communicate with other jurisdictions and with field emergency forces, and to formulate protective action decisions and recommendations during an emergency.

(16) “Final Warning Notification” means a warning in which the local authorities are informed by the dam owner that a failure of the dam is a likely possibility and residents downstream should be evacuated immediately.

(17) “Flood” has the same meaning as “flood” as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies (RCSA).

(18) “Hazard potential” has the same meaning as “hazard potential” as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies (RCSA).

(19) “Inundation map” means a map sufficient in graphic detail and of a scale that clearly shows the downstream inhabited areas and the inundation zones with features and other related information required in section 22a-411a-2(b) of the Regulations of Connecticut State Agencies.

(20) “Inundation zone” means the area downstream of a dam that could be temporarily inundated with water released by a dam failure.

(21) “Operator” has the same meaning as “operator” as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.

(22) “Owner” has the same meaning as “owner” as provided for in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.

(23) “Person” has the same meaning as “person” as provided in section 22a-2(b) of the Connecticut General Statutes.

(24) “Public Service Company” has the same meaning as “public service company” as provided in section 16-2 of the Connecticut General Statutes.

(25) “Professional engineer” means an individual who is currently licensed and registered under section 20-302 of the Connecticut General Statutes.

(26) "Structure" has the same meaning as "structure" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.

(27) "Toe" same meaning as "toe" as provided in section 22a-409-1(a) of the Regulations of Connecticut State Agencies.

SECTION 4.

The Regulations of Connecticut State Agencies are amended by adopting section 22a-411a-2 as follows:

(NEW) Sec. 22a-411a-2. Requirements for Emergency Action Plans (EAPs).

(a) **Emergency Action Plans.** Owners of Class C and Class B dams shall prepare an Emergency Action Plan (EAP) for each Class C and Class B dam owned by them. The owner shall coordinate with the agencies responsible for providing emergency services when developing the plan. The owner shall update the EAP a minimum of every two years, or more frequently as necessary to reflect significant changes. Copies shall be filed with the commissioner, the chief executive officer, and the emergency management officer of any municipality that would potentially be affected in the event of an emergency involving the dam for which the EAP has been prepared.

(b) **Emergency Action Plan Components.** A complete EAP shall include the following components:

(1) An inundation map prepared by a professional engineer who uses all elevations based on a reference to Geodetic North American Vertical Datum (NAVD88).

(A) The map shall show at a minimum, the following features:

- (i) the name and address or location of the dam,
- (ii) pertinent downstream features such as buildings, homes, railroads, bridges, schools, hospitals, camp grounds, other dams, and any other significant facilities, etc.,
- (iii) the inundation zone for wet weather with arrows indicating the direction of the flood wave,
- (iv) a north arrow and bar scale, and
- (v) pertinent downstream cross sections, such as roads (identify the road names).

(B) The following information related to the inundation map shall also be included with the map:

- (i) An estimated timeline that shows arrival times of peak floodwaters expressed in hours and minutes and incremental increase in water depth above the baseline elevation at critical intersection(s), structure(s), or inhabited structure(s).
 - (ii) A list of all streets, roads, and highways, including the address of the residences and businesses subject to flooding.
 - (iii) A location map sufficient in scale to clearly show the exact location of the impoundment in relation to the surrounding area, other dams in the area, and the delineation of the drainage area. Said map shall include a north arrow, a bar scale, and the size of the drainage area noted in square miles.
 - (iv) A description of the method or computer model used to prepare the inundation map.
 - (v) identify road closures.
 - (vi) identify evacuation routes.
 - (vii) identify emergency shelters.
- (2) A dam monitoring procedure that shall outline procedures for monitoring the dam during periods of heavy rainfall and runoff, or when other conditions develop that warrant close monitoring of the dam. At a minimum, the dam monitoring procedure shall provide for the following:
- (A) The identification of the personnel and their alternate(s) responsible for conducting monitoring of the dam and features of the dam to be inspected at given intervals.
 - (B) The Initiation of monitoring of the dam when the National Weather Service announces a Flood Warning for the area where the dam is located or when other conditions develop that warrant close monitoring. Said monitoring shall be conducted at an interval that has been calculated by a professional engineer retained by the owner, to correspond with the particular hydrologic, hydraulic and structural components of the dam. Such monitoring shall include viewing the dam and, if feasible, walking the dam crest at regular intervals to determine if any sloughing of the embankment, cracking, settlement, or movement of the dam has occurred. This shall also include the inspection of the toe of the dam and the abutment contacts to detect any signs of deterioration of the dam or its components, and inspection of the spillway(s) and outlet structure(s) for accumulations of debris.
 - (C) A notification to the local authority that monitoring under the procedure has been initiated in accordance with the EAP on file with the municipality.

- (D) The maintenance of a written record of all monitoring activity which shall include at a minimum, date and time of each inspection interval, rainfall data, reservoir level, observation of any changes in the dam including sloughing of the embankments, cracking, settlement, movement, erosion, seepage, deterioration of abutment contacts, debris obstructing the spillway(s) or outlet structure(s), or any other sign the dam is deteriorating. When observing seepage, the written record shall comment on location, amount of flow and whether clear, cloudy or muddy. When observing movement, sloughing or erosion of the dam the written record shall comment on the depth and location of said conditions.
 - (E) If applicable, a description of all automated monitoring equipment the owner or operator will utilize to conduct monitoring, and a description of a testing procedure for such equipment that occurs at a minimum semi-annually, to ensure proper operation and maintenance.
 - (F) The steps to be taken to provide adequate lighting to view the dam at night.
 - (G) An inventory of emergency equipment and supplies and their location, and personnel which could be utilized by the dam owner or operator to respond to emergencies at the dam, such as clearing debris blocking the spillway, repairing surface erosion of an embankment, placing sandbags, etc.
 - (H) A list identifying personnel and their alternate(s) that would be utilized by the dam owner or operator(s) responsible for decision making and for implementing emergency repairs, when the owner is absent.
- (3) A warning notification procedure that shall provide a formal warning notification process to alert the local authority who is responsible for acting on the warning and, or determining whether to evacuate residents or others within the inundation zone in the event of an emergency, including a warning notification list with addresses for residences, businesses, and highways located in the inundation zone, to be used to warn inhabitants downstream that the dam may fail, or is in imminent danger of failing.
- (A) the dam owner or operator shall provide an Early Warning Notification to the local authority responsible for providing emergency services when any of the following conditions have been observed:
 - (i) A marked increase in seepage through an embankment, particularly if evidence of a boil (release of seepage under pressure which tends to “float” away the material through which it flows) is observed.
 - (ii) An increase in the rate of rise of the impoundment such that the non-overflow section(s) of the dam may be overtopped.
 - (iii) Conditions are developing at the dam that could lead to a potential failure.

(B) the Early Warning Notification shall state:

- (i) the name of the dam owner and operator,
- (ii) the name and location of the dam,
- (iii) conditions that indicate the dam may be compromised, and
- (iv) a notice to the emergency management authority to warn residents in those areas within the limits of potential flooding as described in the Emergency Action Plan for such dam that an evacuation of this area may be necessary.

(C) the dam owner or operator shall provide a Final Warning Notification to alert the local authority who is responsible for acting on the final warning and, or evacuating residents in the inundation zone in the event of an emergency when any of the following conditions have been observed:

- (i) A dramatic increase in seepage flow (or a pre-existing boil), particularly if piping is occurring.
- (ii) Cracking, settlement, or movement of masonry or concrete spillways, training walls or other structures.
- (iii) The rise of the impoundment is such that the non-overflow section(s) of the dam will overtop or is overtopping and the dam is failing or is in imminent danger of failing.
- (iv) Substantial erosion or sloughing of dam embankments.
- (v) An increase in the rate of rise of the impoundment such that the non-overflow section(s) of the dam will be overtopped.
- (vi) Any other condition resulting in a probable failure of the dam.

(D) The Final Warning Notification shall state:

- (i) The name of the dam owner or operator,
- (ii) the name and location of the dam,
- (iii) that conditions at the dam indicate the dam is in imminent danger of failing,
- (iv) that this is a final warning, and

- (v) that this is a notice to the emergency management authority to warn residents in those areas within the limits of potential flooding as described in the Emergency Action Plan for such dam that an evacuation of this area is necessary.
- (4) The location of an Emergency Operation Center where responsible officials will gather during an emergency to direct and coordinate emergency operations.
- (5) A notification flow chart that shows titles or associated contact names with phone numbers of local, state, federal, tribal agencies, and any public service company as defined in subsection (a) of these regulations, that are responsible for providing emergency services. The contacts on the flow chart shall be called when dam monitoring is initiated in response to a National Weather Service Flood Warning, when an Early Warning Notification is recommended by the owner or operator and when a Final Warning Notification (Evacuation) is recommended to the appropriate local authority. The flow chart shall clearly depict the order and circumstance under which named contacts will be notified.
- (6) A distribution list of all local, state, federal, and federal tribal agencies affected that will receive a copy of the EAP.
- (7) A description of the procedure for determining when the emergency can be terminated.
- (8) A description of an exercise, or test to be conducted at a minimum of every two years of the EAP that includes participation of all appropriate personnel identified in the EAP that are responsible for providing emergency services in the event the EAP is initiated.
- (9) A title page with the date the EAP is submitted. The title page shall identify the document as an Emergency Action Plan and specify the dam for which it was developed. The dam, reservoir names, hazard class, and town(s) in which the dam is located shall be included on the title page along with the CT Dam ID number.
- (10) An executive summary that describes the physical components of the dam, pertinent history, the riverine system on both the upstream and downstream area of the dam and any associated purpose of those waters.
- (c) **Submission of Emergency Action Plans.** New and updated EAPs for Class C Dams shall be submitted to the commissioner not later than twelve (12) months from the date this section is adopted. New and updated EAPs for Class B Dams shall be submitted to the commissioner not later than eighteen (18) months from the date this section is adopted.
- (d) **Failure to submit EAPs or EAP updates.** Failure to submit an EAP by the deadline imposed by subsection (c) of this section or to submit an EAP update every two (2) years as required by subsection (a) of this section shall be cause for the imposition of a civil penalty by the commissioner or his designee on the dam owner in accordance with section 22a-6b of the Connecticut General Statutes and section 22a-6b-1 of the Regulations of Connecticut State Agencies.

- (e) **Incomplete submission.** The submission of an EAP lacking information required by this section shall be cause for the commissioner to issue an order to the dam owner requiring the submission of a complete EAP within sixty (60) days of the order. If a submitted EAP is incomplete, the order shall identify the information needed to complete the EAP. The commissioner may impose a civil administrative penalty in accordance with section 22a-6b of the Connecticut General Statutes and section 22a-6b-1 of the Regulations of Connecticut State Agencies for failure to submit a complete EAP in compliance with any order issued by the commissioner or his designee pursuant to this subsection.

REGS-1 Rev. 09/2013
(Statement of Purpose page)

Statement of Purpose

Public Act 13-197 mandates certain changes to the Department's dam safety program and specifically requires the commissioner to update and add to the existing dam safety regulations to incorporate these changes and new requirements.

Sections 1 and 2 - Amendments to RCSA §§ 22a-409-1 and 22a-409-2

These amendments are required to implement recent statutory changes regarding the registration and inspection of dams on private property. The changes to the regulations establish procedures and requirements for dam owners to complete registration of a dam, comply with a schedule for the inspection of their dams by retaining the services of a professional engineer licensed in the State of Connecticut, and to establish fees for inspections undertaken by the department to recover the reasonable cost of inspections that may be conducted by the state under certain circumstances.

Section 3 and 4 Adoption of RCSA § 22a-411a-1 and 22a-411a-2

This new section establishes requirements for emergency action plans for owners of high and significant hazard dams. These Emergency Action Plans require dam owners to create and implement procedures for observing the dams during periods of heavy rainfall and runoff, or when other conditions develop that warrant close monitoring of the dam and communicating with the appropriate emergency management authorities regarding the status of the dam and to provide warning about potential or imminent dam failure, including recommendations to implement evacuation plans for residents or businesses in downstream areas potentially affected by a dam failure.

HEARING REPORT

Regarding Amendment of Dam Safety Regulations and The Adoption of a New Regulation Concerning Emergency Action Plans

**Hearing Officer:
Brian Thompson**

Date of Hearing: April 7, 2015

On February 24, 2015 the Commissioner of the Department of Energy and Environmental Protection (DEEP) published a Notice of Intent to Amend Dam Safety Regulations 22a-409-1 and 22a-409-2, and adopt a new section, 22a-409-3, Requirements for Emergency Action Plans.

Pursuant to such notice, a public hearing was held on April 7, 2015, with the public comment period closing on April 10, 2015.

Note: *The notice of intent was approved and published without knowledge that the section of Public Act 13-197 referencing Emergency Action Plans was actually codified in the most recent version of the Connecticut General Statutes as Section 22a-411a. This codification requires the section of the regulations pertaining to Emergency Action Plans to be adopted under Section 22a-411a-1 and 22a-411a-2, rather than 22a-409-3.*

Therefore, all responses to comments on emergency action plan requirements that recommend a revision to language proposed in section 22a-409-3 will reflect a corrected regulatory citation of 22a-411a-1. Definitions, or 22a-411a-2. Requirements for Emergency Action Plans (EAPs).

Hearing Report Content

This report describes the proposal, identifies principal reasons in support of and in opposition to the proposal, and summarizes and responds to all comments entered into the hearing record on the proposal. Comments are addressed in chronological order of the appropriate sections of the proposed dam safety regulations.

An abbreviation is used to identify the commenter for each comment. There were a total of 9 commenters. A list of commenters is provided as Attachment 1 of this report.

Summary of the Proposal.

DEEP dam safety regulations are required to implement statutory changes regarding dam safety mandated by Public Act 13-197. The statutory changes shifted responsibility for inspections to dam owners to ensure compliance with inspection schedules in the interest of protecting human health and public safety. Under certain circumstances and in the event owners do not comply with the inspection requirements, DEEP retains authority to conduct the regulatory inspection. The proposed regulatory amendments also establish inspection fees to allow DEEP to recover the cost of any regulatory inspection that it conducts when a dam owner fails to comply with the regulatory inspection requirement.

The statutory changes also require dam owners to submit Emergency Action Plans for every high (Class C) and significant (Class B) hazard dam they own and update them every two years.

Support for the Proposal.

Two commenters submitted comments in support of the proposal.

Opposition to the Proposal.

No one submitted comments in opposition to the adoption of this proposal.

COMMENTS AND RESPONSES**GENERAL****Comment**

PB - ASDSO Audit Recommendations: I am aware that representatives of the Association of State Dam Safety Officials (ASDSO) conducted an audit of the DEEP's Dam Safety Program a couple of years ago. Are their recommendations available for public review and were any of the ASDSO's comments incorporated into the draft regulations.

Response: The DEEP requested an audit of the CT dam safety program from the Association of Dam Safety Officials (ASDSO) and did take the recommendations made by the audit team into consideration when drafting the proposed dam safety regulations.

A copy of the audit report is available from the DEEP Dam Safety Program to the public upon request.

Comment

PB - Spillway Design Criteria: I was somewhat surprised that the revised regulations did not include recommendations to assist the engineer in selecting the magnitude of the inflow/spillway design flood (IDF). Many states provide IDF requirements for dams using a prescriptive approach. FEMA P-94 (August 2013) provides recommendations for the IDF based on Hazard Potential Classification: High Hazard = Probable Maximum Flood (PMF); Significant Hazard = 1,000 year flood; and Low Hazard = 100-year flood. FEMA P-94 also provides allowances (as do other state dam safety regulations) for conducting incremental consequence analysis or risk-informed decision making studies to evaluate the potential for selecting an IDF lower than the prescribed standard. Having IDF standards in the regulations would help to provide uniformity in assessing spillway capacity for the Connecticut dam safety consulting community.

Response:

CT has a minimum spillway design standard for the safe passage of the 100-year return frequency flood with freeboard. Otherwise, it follows the U.S. Army Corps of Engineers (USACOE) Spillway Design Criteria. DEEP plans to develop spillway design criteria to further assist dam engineers undertaking dam assessment, inspection and design.

DEEP recommends no change.

Sec.22a-409-1. Definitions. Registration of dams and similar structures.

Note: *The following definitions have been deleted from section 409-1(a) and transferred to section 22a-411a-1: Dam failure, Early Warning Notification, Emergency, Emergency Action Plan or EAP, Emergency management authority, Emergency Operation Center, Final Warning Notification, Inundation map, and Inundation zone.*

Sec.22a-409-1(a) “Qualified dam safety professional”

Comment

PM - Definitions “Qualified dam safety professional” means a person with technical training in the inspection of dams acting under the supervision of a professional engineer who possesses specific education and training related to the investigation, design, construction, operation, and maintenance of a dam and the potential causes and consequences of dam failure and other adverse dam incidents.”

Does this mean that the professional engineer possesses specific education and training related to?

Comment

PB - Definition of “Qualified dam safety professional”: The proposed regulations in Section 2 (c) (2) indicate that the inspection can be conducted by the Qualified dam safety professional **OR** by a professional engineer. It has [sic] been my experience that visual inspections are typically conducted by a minimum of 2 engineers; one being a

staff level engineer who may not have yet [sic] attained licensure and the other being a professional engineer. In my opinion, it is very important that a professional engineer be part of the inspection team. The regulations now rightly put the burden of dam inspection onto the owner. As the regulation is currently drafted, there may be an economic incentive for the engineering consultant to solely use unlicensed junior engineers to conduct the inspection without a professional engineer present. This has the potential for subtle, but critical deficiencies to be missed during the visual inspection.

Response

DEEP agrees it is important that a professional engineer be part of the inspection team. Allowing the use of a “qualified dam safety professional” to conduct visual inspections may provide an economic incentive to solely use unlicensed junior engineers to conduct inspections without the benefit of an experienced professional engineer being present. While it is a common practice to utilize un-licensed junior engineers to conduct visual inspections DEEP would like to encourage the practice of having at least one professional engineer on the inspection team.

DEEP recommends the deletion of the definition of “Qualified dam safety professional” and all references to the term “Qualified dam safety professional” found in section 22a-409- 2 of the proposed regulation.

Note: *The numbering of the definitions have been changed in Sec. 22a-409-1(a) to accommodate the deletion of the above definition as well as the deletion and transfer of 9 definitions pertaining to emergency action plans to section 22a-411a-1.*

Sec. 22a-409-1(b)(12) Registrations.

Comment

CWWA - The proposed regulations also require the payment of a registration fee in Section 22a-409-1(b)(12). This section references the fee in 22a-409(h), however, which references the inspection fee. It is difficult to determine whether the registration fee is also \$3000. If so, the fee is excessive for a registration and should be reduced. These provisions should also be clarified.

Comment

CCM – Section 22a-409-1(b)(12) requires dam owners to remit a registration fee to DEEP. These fees are excessive and impose an undue cost burden and unfunded mandate on towns and cities during difficult fiscal times. CCM would ask that towns and cities be granted a waiver from any fees incorporated into the new regulations.

Comment

COST – Section 22a-409-1(b)(12) requires dam owners to remit a registration fee to DEEP. These fees are excessive and impose an undue cost burden on municipalities during difficult fiscal times. Recognizing the limited resources available to

municipalities, state laws often exempt municipalities from state fees or taxes. COST therefore recommends that the fees included in the proposed regulations be waived for municipalities.

Response:

There is a typographical error, i.e. a reference to 22a-409(h) which has caused some confusion regarding fee amounts. This incorrect reference has been deleted. The correct reference is 22a-409(b) of the General Statutes.

The majority of dam owners, including municipalities, registered their dams more than 25 years ago. The registration fee is a one-time fee. For the few municipal dam owners that have dams not yet registered, the current fees as referenced in 22a-409(b) of the General Statutes are based on the Dam Height and are as follows:

<u>Dam Height</u>	<u>Fee</u>
Less than 5 ft	\$ 0
5 – 15 ft	\$50
15-15 ft	\$100
Over 25 ft	\$200

The current fees are minimal and given that the majority of municipalities registered their dams many years ago when the registration fees were far less, and municipalities were given a 50% discount, there is no significant financial burden being imposed on municipalities to register the small number of dams that may still be un-registered.

For those few municipalities that may still have dams to register, the State will continue the policy of giving a 50% discount on fees charged to municipalities when they register dams not yet registered by October 1, 2015.

Dam owners who do not register their un-registered dams by October 1, 2015 may be subject to an enforcement action by the Department of Energy and Environmental Protection.

The CT DEEP Dam Safety Program will provide a copy of a Certificate of Dam Registration (CDR) upon request at no cost to owners who have lost their CDR. The Dam Safety Program is automatically sending out CDR's with Maintenance and Engineering Requests to dam owners who have submitted inspection reports.

DEEP recommends the following revision:

22a-409-1(b)(12) a check or money order payable to the [DEP, Water Resources Unit] DEEP Dam Safety Program for the amount of the registration fee [by] in accordance with section 22a-409(b) of the General Statutes, as amended; and

22a-409-1(c) Changes in registration information.

No comments received on this subsection.

22a-409-1(d) Certificate of Dam Registration (CDR).

No comments received on this subsection.

22a-409-1(e) Fees.

No comments received on this subsection.

22a-409-1(f) Forfeiture and Injunction.

No comments received on this subsection.

22a-409-1(g) Violations.

No comments received on this subsection.

Sec. 22a-409-2. Dam safety inspection [regulations] and classification.

Sec. 2a-409-2(a) Jurisdiction.

Comment

Note: *The following is a summarized version of a comment from the Town of East Hartford regarding the applicability of dam safety regulations to a flood control system regulated by the U.S. Army Corps of Engineers (USACOE). To see the full text of this comment see Attachment 1 of this report.*

DH - The Town [of East Hartford] is a local sponsor of a federally constructed Flood Damage Reduction Project / Flood Protection System (System) located along the banks of the Hockanum and Connecticut Rivers. The System was constructed between 1939 and 1943 in response to major flood events of the Connecticut River in the 1930's which resulted in loss of life and significant property damage. Ownership as well as the responsibility to maintain and operate the System was transferred from the Federal Government to the Town upon completion of construction.

The Town as a local sponsor has been subject to Federal oversight and regulation of the System since the 1940's. The Federal oversight includes annual inspections as well as periodic inspections at 5 year intervals which are made by USACE [sic] personnel.

The Town does not feel that adding a second layer of third party inspection process as a result of the proposed State dam safety regulations will result in improvements to public / life safety or add any additional benefit.

The Town of East Hartford recommends that regulation and oversight of Flood Damage

Reduction / Flood Protection Systems that are currently regulated by the Federal Government remain the responsibility of the Federal Government.

Response

DEEP agrees an additional layer of government oversight for the flood control dams already regulated by the U.S. Army Corps of Engineers (USACOE) would not result in any improvement to public safety. The DEEP will accept the completion of USACOE inspections as compliance with DEEP dam safety regulatory inspection requirements.

DEEP recommends that subsection (a) Jurisdiction be deleted, subsection (d) Classification of Dams be moved up to become subsection (a) to improve organization of this section, and subsection (b) be revised to address applicability of the regulations, as follows:

(2)(a) **[Jurisdiction.** All dams which must be registered pursuant to Section 22a-409 of the General Statutes shall be under the jurisdiction of the Commissioner. Dams of the State, or any political subdivision thereof, and all dams within the State except those of the United States or its instrumentalities are included within the jurisdiction conferred by this section.]

Classification of Dams.

(1) The commissioner shall assign each dam to one of five classes according to the potential impacts of a dam failure. The factors used to evaluate and assign a hazard potential are the physical characteristics of the dam, such as the dam height and capacity of the impoundment, the location of the dam, the areas impacted by a failure of the dam, and potential damage to property, infrastructure, or threat to human life as described below:

(A) A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:

- (i) no measurable damage to roadways;
- (ii) no measurable damage to land and structures; and
- (iii) negligible economic loss.

(B) A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:

- (i) damage to agricultural land;
- (ii) damage to unpaved local roadways;

(iii) minimal economic loss.

(C) A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:

(i) damage to normally unoccupied storage structures;

(ii) damage to paved local roadways;

(iii) moderate economic loss.

(D) A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:

(i) possible loss of life;

(ii) minor damage to habitable structures, residences, including but not limited to industrial or commercial buildings, hospitals, convalescent homes, or schools;

(iii) damage to local utility facilities including water supply, sewage treatment, fuel, power, cable or telephone infrastructure, causing localized interruption of these services;

(iv) damage to collector roadways and railroads;

(v) significant economic loss.

(E) A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:

(i) probable loss of life;

(ii) major damage to habitable structures, residences, including but not limited to industrial or commercial buildings, hospitals, convalescent homes, or schools;

(iii) damage to major utility facilities including public water supply, sewage treatment plants, fuel storage facilities, power plants, or electrical substations causing widespread interruption of these services;

(iv) damage to arterial roadways;

(v) great economic loss.

(2) The classification of a Class C, B, BB, and A dam shall be reviewed during each regulatory inspection.

(3) Dams shall be subject to reclassification at any time the commissioner determines that the hazard potential of the dam has changed.

(4) The dam owner may submit a request to change the hazard classification assigned to the owner's dam based on an analysis submitted to the commissioner that supports the reclassification. Recommendations made by the owner to reclassify the owner's dam shall be subject to review and approval by the commissioner.

(5) Where a dam is so located that its failure would likely cause a downstream dam to fail, the hazard classification of this dam shall be at least as great as that of the downstream dam.

(6) Potential damage to habitable structures will be considered minor when habitable structures are not within the direct path of the probable flood wave produced upon failure of a dam and when such structures will experience:

(A) No more than 1.5 feet of rise of flood water above the lowest ground elevation adjacent to the outside foundation walls; or

(B) No more than 1.5 feet of rise of flood water above the lowest habitable floor elevation of the structure; the lower of the elevations governing.

22a-409-2(b) [Periodic] Regulatory Inspections.

DEEP recommends the following revision in response to the Town of East Hartford's comment regarding flood control dams already regulation by the ACOE.

(b) [Periodic] Regulatory Inspections - Applicability. [The following dams shall be regularly inspected by the Department of Environmental Protection at a frequency as described in Section 22a-409-2(e)(2) of these regulations] The owner of a dam classified by the commissioner as Class C, B, BB, or A in accordance with subsection (a) of this section shall ensure a regulatory inspection is conducted for such dam in accordance with the requirements of this section except dams owned or regulated by the United States or its instrumentalities that are visually inspected on a regular basis in

accordance with applicable federal requirements to the satisfaction of the commissioner:

- (1) If the commissioner determines that a dam classified as AA poses a unique hazard, the commissioner may require its owner to conduct a regulatory inspection in accordance with this section except dams owned or regulated by the United States or its instrumentalities that are visually inspected on a regular basis in accordance with applicable federal requirements to the satisfaction of the commissioner.
- (2) All dams of the state or any political subdivision of the state shall be required to conduct a regulatory inspection.

22a-409-(2)(c) [Periodic] Regulatory Inspection Procedures

No comments were specifically made on the introductory paragraph in subsection (c). DEEP recommends Section 2(c) be revised to remove all references to “qualified dam safety professional” and to improve clarity:

(c)[Periodic] Regulatory Inspection Procedures. All regulatory inspections must be conducted by a professional engineer and use a standard dam inspection form and instructions that direct the proper use of the form. Both the inspection form and the instructions will be developed by the commissioner and based upon accepted standards of a visual dam inspection.

2(c)(2)

DEEP recommends Sec. 2(c)(2) be deleted because this subdivision is no longer applicable due to the previous recommendation to delete the term “qualified dam safety professional”.

22a-409-2(c)(1)(D) & 22a-409- 2(c)(3)(G) & (H)

Comment

PB - Need for Hydrologic and Structural Stability Analyses: There seem to be some ambiguity as to whether hydrologic & hydraulic (H&H) and structural stability analyses (i.e. assessments) should be conducted as a normal part of the Regulatory Inspection Procedures. Section 2 (c) (1) (D) states: *Evaluation of the general condition of the structure, including when possible, assessment of its hydrologic and its hydraulic capabilities and structural stability.* This implies that some sort of rigorous engineering analyses is expected as part of the visual inspection report. However, later in the regulations (Section 2 (c) (3) (G) and (H), clearly indicates that supplemental H&H and stability analyses are part of the recommendations that will arise from the Regulatory

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Inspection. The implication being that these analyses would be performed subsequent to the submission of the Inspection Report to DEEP.

Sec. 2(c)(3)(G)

Comment

WP-This paragraph suggests that all dams, regardless of their hazard class, would be required to have a spillway sufficient to pass the 100-year flood storm at a minimum. Such a requirement could result in costly changes to very small, low hazard dams, many of which likely do not have sufficient spillway capacity to pass the 100-year flood storm.

Response

DEEP agrees that requiring a Hydrologic & Hydraulic analysis as part of the regulatory inspection requirement could result in costly changes to very small, low hazard dams, many of which likely do not have sufficient spillway capacity to pass the 100-year flood storm.

DEEP did not intend to require a rigorous engineering analysis as part of the regulatory inspection. The engineer is expected to evaluate the need for a stability analysis or hydrologic & hydraulic analysis during the regulatory inspection and make recommendations for such analysis, if determined necessary.

If the commissioner concurs with the engineer's recommendation to conduct a stability analysis or hydrologic and hydraulics analysis the commissioner will send a request to the owner requesting such analysis be completed.

DEEP recommends deleting section 2(c)(1)(D) to make it clear that a rigorous engineering analyses is not expected as part of the regulatory inspection:

[(D) Evaluation of the general condition of the structure, including when possible, assessment of its hydrologic and its hydraulic capabilities and structural stability.]

DEEP also recommends the following reorganization and revision to Sec. 2(c)(3) to further clarify that a hydrologic and hydraulic analysis or a stability analysis is not required as of the regulatory inspection.

[(3)](2) [A standard dam inspection checklist based upon accepted standards of visual dam inspection and inspection guidelines which direct the proper use of the checklist shall be prepared by the Commissioner and will be utilized by the inspection team.] The professional engineer shall prepare a written report using a form prescribed by the commissioner detailing the findings of the regulatory inspection which shall include, but not be limited to, the following:

(A) An assessment of the condition of the structure based on the visual observations and available file data [on] related to the design, construction, post construction investigations, operation, maintenance and performance of the [structure, the hydrologic and hydraulic capacities and the structural stability] dam [;] and

(B) Recommendations [for any emergency measures or actions, if required to assure the immediate safety of the structure], if any are required as a result of the inspection and assessment, for:

(i) emergency measures or actions, if required to assure the immediate safety of the structure;

[(C)](ii) [Recommendations for] remedial measures and actions related to design, construction, operation, maintenance and inspection of the structure [, if required];

[D] (iii) [Recommendations for] additional detailed studies, investigations and analyses [, if required; and];

[E] (iv) [Recommendations for] time periods appropriate for implementing [any necessary emergency, remedial measures and] the actions [and any necessary additional investigations and analyses, as required by] recommended in accordance with [subparagraph (B), (C) and (D)] clauses (i), (ii), and (iii) of this [subdivision] subparagraph; [and]

[F] (v) routine maintenance and inspection by the owner, [if required.];

(vi) a hydrologic and hydraulic analysis based on file data, visual observations, or information provided by the owner that indicates the capacity of the spillway is insufficient to safely pass the spillway design flood or at a minimum the 100-year flood, if required; and

(vii) a stability analysis based on file data, visual observations, or information provided by the owner that indicates the stability of the dam may be structurally unsound under normal and extreme loading conditions.

Sec. 22a-409- 2(c)(4)

Comment

PM - 2.C.4 - "The [Commissioner] owner shall furnish a copy of the written report to the [owner] commissioner not later than 30 days from the date year he or she receives the report, but no later than March 15th of the year following the **date** **year** the owner received the notification letter sent by the commissioner in accordance with section 22a-409(c) of the Connecticut General Statutes."

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This is not clear. For example notices went out in January 2015. This could be interpreted to mean that reports are due March 15, 2015. It appears that what is meant is for inspection reports to be submitted no later than March 15, 2016. Suggest deleting red and adding green highlighted word.

Response

DEEP agrees with the suggested change and recommends Subsection 2(c)(4) be revised as follows:

[(4)] (3) The [Commissioner] owner shall furnish a copy of the written report to the [owner] commissioner not later than 30 days from the date he or she receives the report, but no later than March 15th of the year following the year the owner received the notification letter sent by the commissioner in accordance with section 22a-409(c) of the Connecticut General Statutes.

Sec. 22a-409-2(d) Classification of Dams.

No comments were received on this subsection. However, DEEP decided to re-arrange the order of this subsection so it appears earlier, i.e. and becomes subsection (a) in this section. As a result the subsection following will be changed as necessary to accommodate this change.

DEEP also recommends revision of 22a-409-2(d)(1)(A) to improve clarity by deleting the words "any of" to read as follows:

(1)(A) A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in [any of] the following:

Sec.22a-409-2(e) Inspection [by the Owner] Schedule

COST - Many towns will have to retain a licensed professional engineer and other consultants in order to perform inspections and prepare detailed Emergency Action Plans. This will impose additional costs on municipalities. The inspection schedule for dams as outlined in the proposed regulations requires inspections to be performed more frequently than in the past, resulting in additional costs on municipalities. COST recommends that DEEP attempt to mitigate these costs by 1) Requiring dams to be inspected on a less frequent basis unless certain factors warrant additional inspections; and 2) Streamlining the information and data that must be submitted as part of the EAP.

Comment

CCM - In order to comply with the proposed regulations most towns and cities will be required to contract with outside engineering companies to conduct the inspections. This requirement will impose additional costs on municipalities further straining local

budgets and local taxpayers. The proposed inspection schedule for dams would appear to be excessive and CCM recommends that DEEP address the costs by reducing the frequency of inspections unless warranted by existing conditions and basis reducing the requirements needed in the proposed Emergency Action Plans.

Response

The cost impact on municipalities is expected to be minimal to moderate. If towns choose to use engineers on staff to inspect their own dams the cost impact is expected to be minimal. If towns choose to hire professional engineers from the private sector to inspect their town owned dams the cost will be the same as it will be for private dam owners. If a municipality were to own a high hazard dam at an average of \$3,000/dam inspection and with an inspection schedule of every two years, the average cost to the town would increase from \$165.00/year to \$1,500/year per high hazard dam. In the case of a significant hazard dam, the municipality would pay on average, \$600.00/year compared to the nominal fee of \$66.00/year.

The proposed regulations do not determine the cost of the inspection but allow the free market and competition to dictate the price for an inspection. Professional engineers are currently charging \$1,500 to \$5,000 for dam inspections depending on site conditions and complexity of the structure.

The proposed regulation did not increase the frequency of inspections for any hazard class. Inspection schedules remain the same since the regulations were adopted in 1987, more than 25 years ago, and these schedules are consistent with national standards.

There are 512 (17%) of dams throughout the state with various hazard classifications that are owned by a municipality. Many of those municipalities are likely to have professional engineers on staff and they may choose to inspect their own dams and avoid the cost of hiring a professional engineer from the private sector. Some municipalities may prefer to hire professional engineers to perform their inspections.

There are 68 towns that own either high or significant hazard dams. There are 61 towns that own only moderate or low hazard dams which will require less effort to inspect and are inspected less frequently. There are 40 towns that do not own any dams in their town.

The department anticipates the cost for subsequent inspections will be less than the initial inspection which typically requires more research and preparation by the professional engineer conducting the initial inspection and preparing the initial inspection report. Dams with higher hazard classifications will require more frequent inspections than dams with lower hazard classifications.

DEEP recommends no change.

Sec.22a-409-2(f) Responsibility of the Owner. *(Revised to 2(g)).*

No comments were received on this subsection. This subsection will become subsection (g) due to the relocation of subsection 2(d) Classification of dams to subsection 2(a).

Sec. 22a-409-2(g) Inspection [Schedule] by the Commissioner. *(Revised to 2(h)).*

No comments were received on this subsection. This subsection will become subsection (h) due to the previous reorganization of subsections.

DEEP recommends the following revision due to the deletion of all references to the term “qualified dam safety professional”:

- (2) Any inspection conducted by the Commissioner in accordance with this subsection, including a regulatory inspection, shall be performed by a professional engineer or personnel of the DEEP Dam Safety Program with technical training in the inspection of dams and under the supervision of a professional engineer.

Sec. 22a-409-2 (h) Fees for Inspection by the State. *(Revised to 2(f)).*

Note: This subsection will become subsection 2(f) due to the reorganization of previous subsections.

Comment

CWWA - The proposed regulations require dam owners to remit a \$3000 fee to DEEP for regulatory inspections performed pursuant to Section 22a-409-2(b). This provision appears to be duplicative inasmuch as under Section 22a-409-2(b), dam owners are required to retain a licensed engineer to perform such inspections not the state. This fee should therefore be eliminated because it imposes an unnecessary cost burden on dam owners, who are already required to expend resources to retain the services of a professional engineer.

Comment

COST - Public Act 13-197 shifts responsibility for inspecting dams from the state Department of Energy & Environmental Protection (DEEP) to dam owners, including municipalities. COST therefore opposes the imposition of a \$3,000.00 fee on dam owners for inspections performed by DEEP. Recognizing the limited resources available to municipalities, state laws often exempt municipalities from state fees or taxes. COST therefore recommends that the fees included in the proposed regulations be waived for municipalities.

Comment

CCM – Public Act 13-197 Shifts responsibility for inspecting dams from the state Department of Energy & Environmental Protection (DEEP) to dam owners, including municipalities. CCM opposes the \$3,000 fee required for inspections performed by DEEP.

Response

DEEP is not charging a duplicative inspection fee for dams inspected by professional engineer's retained by the dam owner.

If DEEP is forced to conduct a regulatory inspection in response to a non-compliant dam owner, the agency must have the ability to recover the cost of performing such an inspection. DEEP must charge a fee that reflects at least fair market value to avoid creating an economic incentive for non-compliance with inspection requirements.

The \$3,000 fee for a regulatory inspection performed by DEEP due to non-compliance was established through an informal poll of several engineering firms. The engineers responded with a range of engineering fees depending on variables such as the hazard classification and the complexity and size of the dam.

DEEP will pursue enforcement actions against dam owners who fail to inspect their dams in accordance with the schedule for the respective hazard class and the agency can't provide an economic incentive for non-compliance by giving a non-compliant dam owner a discounted inspection fee.

DEEP recommends the following revision to improve clarity to section 2(f), formerly 2(h):

[(h)] (f) Fees for Inspection by the State.

- (1) [Each owner shall pay an inspection fee to cover the cost to the State of making both scheduled inspections and post-flood inspections within thirty (30) days after receipt by the owner. Such fee bill shall accompany the written report and shall be paid within thirty (30) days after receipt by the owner.] In the event the commissioner conducts a regulatory inspection of an owner's dam because that owner failed to do so as required by subsection (b) of this section, the owner shall pay an inspection fee to cover the cost to the State for conducting the regulatory inspection. [Such fee bill shall accompany the written report and] Any invoice for such fee shall be paid in accordance with the instructions on the invoice.
- [(2) The owner shall submit the inspection fee by check, or money order payable to DEP Dam Safety Program.]

[(3)] (2) The fee for each regulatory inspection made by the State of an owner's dam shall be [according to the following:] \$3000.00.

[Hazard Class	Fee
Class A (low)	\$150.00
Class BB (moderate)	\$150.00
Class B (significant)	\$250.00
Class C (high)	\$350.00]

[(4)] (3) The [Commissioner] commissioner shall waive the regulatory inspection fee for any dam which is owned by the State of Connecticut.

(NEW) Sec.22a-411a-1. Definitions and 22a-411a-2. Requirements for Emergency Action Plans (EAPs). *Formerly (NEW) Sec.22a-409-3. Requirements for Emergency Action Plans (EAPs).*

GENERAL

Comment

CWWA - Inasmuch as the EAP includes safety sensitive information, the EAP should not be made publicly available, consistent with Section 1-210(b)(19)(viii) and (ix) of the Connecticut General Statutes.

Response

DEEP is aware of the statute cited above and will take necessary steps to ensure compliance with the statute.

Comment

CCM - In order to comply with the proposed regulations most towns and cities will be required to contract with outside engineering companies to create the required Emergency Action Plans. This requirement will impose additional costs on municipalities further straining local budgets and local taxpayers. CCM recommends that DEEP address the costs by reducing the requirements needed in the proposed Emergency Action Plans.

COST - Many towns will have to retain a licensed professional engineer to prepare detailed Emergency Action Plans. This will impose additional costs on municipalities. COST recommends that DEEP attempt to mitigate these costs by streamlining the information and data that must be submitted as part of the EAP.

Response

The narrative portion of the EAP does not have to be written by a professional engineer. The preparation or update of an inundation map will need to be based on an engineer's analysis. Municipal dam owners have the option of using a professional engineer to prepare Emergency Action Plans, an option not available to most private dam owners. Some towns will exercise that option and some towns may choose to hire an outside professional engineer rather than use in house engineers.

DEEP believes the information required for the Emergency Action Plans are the minimum requirements needed to ensure that dam owners have a practical document to assist them and the town in responding to the threat of a dam failure.

Currently there are 46 towns in full compliance with the requirement to have an emergency action plan (EAP) and those plans will need to be updated once the proposed regulation is adopted. There are 22 towns that currently do not have EAPs.

Once dam owners have updated their EAPs and continue updating them every two years, the cost for keeping an EAP current should be minimal as the updates are likely to be information in the narrative portion of the EAP, such as changes in contact names or titles.

DEEP recommends no changes in response to these comments.

(NEW) Sec. 22a-411a-1. Definitions.

Note: *The following definitions have been deleted from Sec. 22a-409-1(a) and transferred to Sec. 22a-411a-1: Dam failure, Early Warning Notification, Emergency, Emergency Action Plan or EAP, Emergency management authority, Emergency Operation Center, Final Warning Notification, Inundation map, and inundation zone.*

The following definitions have also been added to this section and incorporated by reference to definitions also found in Sec. 22a-409-1(a): Abutment, Appurtenance, Breach, Dam, Embankment, Flood, Hazard potential, Operator, Owner, Structure, and Toe.

The following definitions have been copied from Sec. 22a-409-1(a) to Sec. 22a-411a-1: Commissioner, Person, and Professional Engineer.

The definition of "inundation map" has been revised in response to a comment on sec. 22a-411a-2(b), formerly sec. 22a-409-3(b). See comment and response under section 411a-2(b) for details.

A new definition "Public Service Company" has been added to 22a-411a-1 in response to a comment on sec. 22a-411-2(b)(5), formerly 22a-409-3(b)(5). See comment and response under 22a-411a-2(b)(5) for details.

The following new definitions have been added to 22a-411a-1 to define Class C and Class B dams referred to in Sec. 22a-411a-2:

"Class B Dam" means a significant hazard potential dam as provided for in section 22a-409-2(a)(1) of the Regulations of Connecticut State Agencies.

"Class C Dam" means a high hazard potential dam as provided for in section 22a-409-2(a)(1) of the Regulations of Connecticut State Agencies.

(NEW) Sec. 22a-411a-2. Requirements for Emergency Action Plans (EAPs).

Formerly Sec. 22a-409-3 Requirements for Emergency Action Plans (EAPs)

3(b) Emergency Action Plan Components

Comment

WP - The use of an aerial photography as the base map should be allowed to better illustrate the location of specific structures. We suggest that the mapping be prepared under the supervision of a professional engineer since in most cases it is technically drawn by a CAD technician based on modeling prepared by a professional engineer.

Response

DEEP agrees the use of an aerial photography map as a base map to depict the inundation area is acceptable as long as the map is sufficient in graphic detail and of a scale that clearly shows the downstream inhabited areas and the inundation zones with features required in 22a-411a-2(b)(1) as revised in response to comments on the proposed regulation.

DEEP recommends the following revision to the definition of “inundation map”.

“Inundation map” means a map sufficient in graphic detail and of a scale that clearly shows the downstream inhabited areas and the inundation zones with features and other related information required in section 22a-411a-2(b) of the Regulations of Connecticut State Agencies.

DEEP also recommends revising section 22a-411a-2(b)(1), *formerly 22a-409-3(b)(1)*, as follows:

(b) **Emergency Action Plan Components.** A complete EAP shall include the following components:

(1) An inundation map prepared by a professional engineer who uses all elevations based on a reference to geodetic North American Vertical Datum (NAVD88).

Sec. 22a-411a-2. Requirements for Emergency Action Plans (EAPs)

Formerly Sec. 22a-409-3. Requirements for Emergency Action Plans (EAPs)

Comment

CWWA - Public Act 13-197 requires dam owners to submit Emergency Action Plans (EAPs) for high hazard and significant hazard dams which must include: 1) criteria and standards for inundation studies and inundation zone mapping; 2) procedures for monitoring the dam or structure during periods of heavy rainfall and runoff; 3) a formal notification system. However, under the proposed regulations, the EAPs require dam owners to include a significant amount of information in the plan which may undermine its effectiveness in emergencies. We are concerned that the electronic file may be difficult to email to municipalities and emergency personnel given its size. We believe the EAP should be streamlined to ensure that it is not overly burdensome to prepare and update and more useful as a tool in emergencies.

Sec. 22a-411a-2(b)(1)(A)(ii)

Formerly Sec. 22a-409-3(b)(1)A)(ii)

Comment

WP - It is recommended that an option be allowed to include the local names of specific structures be included on a page in the EAP rather than on the actual inundation maps. Such a list would also allow less expensive updating should these names change as modification to an inundation map is more costly than a typed page in an EAP.

Response

There is no requirement for the dam owner to mail the EAP electronically. Dam owners have the option to choose regular mail, email, courier, personal delivery, etc. to send copies of their EAP.

Once a dam owner has met the obligation to file a copy of their EAP with the commissioner, the CEO and the Emergency Officer of the municipality affected, the dam owner may also provide selected information electronically from the EAP, such as the inundation map to the emergency officer, during an emergency if they wish.

There is nothing in these regulations that prevent the dam owner from preparing a smaller package that is of the size that can be emailed to local officials before or during an event.

DEEP recognizes the inundation map will require more computer memory space and that some of the information related to the inundation map can be included with the map on a separate page, rather than depicted on the map.

DEEP recommends deleting the requirement to include local names or terms for downstream features and making the following revision to section 22a-411a-2(b)(1)(A)(ii), *(formerly 22a-409-3(b)(1)(A)(ii))*:

(ii) pertinent downstream features such as buildings, homes, railroads, bridges, schools, hospitals, camp grounds, other dams, and any other significant facilities, etc.,

DEEP agrees to require the identification of road closures, evacuation routes, and emergency shelters on a separate page to be included with the map.

The dam owner or his engineer has the option to put any additional information they feel is relevant on the inundation map in addition to the information required by this regulation.

DEEP recommends deleting sec. 22a-411a-2(b)(A)(vii), (viii), and (ix) *(formerly sec. 22a-409-3(b)(A)(vii), (viii), and (ix))* and moving these requirements to 22a-411a-2(b)(1)(B (v),(vi), and (vii) respectively as follows:

(B) The following information related to the inundation map shall also be included with the map:

- (i) An estimated timeline that shows arrival times of peak floodwaters expressed in hours and minutes and incremental increase in water depth above the baseline elevation at critical intersection(s), structure(s), or inhabited structure(s).
- (ii) A list of all streets, roads, and highways, including the address of the residences and businesses subject to flooding.
- (iii) A location map sufficient in scale to clearly show the exact location of the impoundment in relation to the surrounding area, other dams in the area, and the delineation of the drainage area. Said map shall include a north arrow, a bar scale, and the size of the drainage area noted in square miles.
- (iv) A description of the method or computer model used to prepare the inundation map.
- (v) identify road closures.
- (vi) identify evacuation routes.
- (vii) identify emergency shelters.

Sec.22a-411a-2(b)(1)(A)(iii)

Formerly Sec. 22a-409- 3(b)(1)(A)(iii)

Comment

WP - To facilitate approval from the CT DEEP of the inundation mapping, and to ensure consistency between assessments of dams, we recommend that the term “wet weather” be defined so that the modeling performed uses the appropriately sized storm event for this assessment.

TH - Only the plan showing the largest inundation zone (probably wet weather) should be included in the EAP. Having wet weather and dry weather inundation plans could be confusing during an emergency and would increase the file size of the EAP making it more difficult to disseminate electronic copies.

Response

DEEP agrees that requiring the depiction of both dry and wet weather zone on the inundation map would increase the file size of the EAP, and it may cause some confusion in certain circumstances.

DEEP agrees to require only wet weather inundation on maps.

DEEP also agrees there should be consistency between assessments of dams and will provide recommended models to use for the appropriately sized storm event for a wet weather inundation in guidance being developed by DEEP.

DEEP is planning on developing an EAP Guidance document that will address the various computer models for use in inundation mapping as well as pre-breach hydrology.

DEEP recommends the following revision to Sec. 22a-411a-2(b)(1)(A)(iii):

(b)(1)(A)(iii) “the inundation zone for wet weather with arrows indicating the direction of the flood wave, and”

Sec. 22a-411a-2(b)(1)(B)(v), (vi), and (vii)

Formerly Sec. 22a-409-3(b)(1)(A)(vii),(viii), and(ix)

WP - Many dams that would be required to have an EAP are private dam owners. The responsibility for making decisions regarding proper response to a dam failure to ensure public safety rests with the emergency response agencies of the affected community(ies). We question the appropriateness of requiring a private dam owner to “assume responsibility” for determining the actions that should be taken by emergency responders. Also, evacuation shelters may not be in the immediate area shown on the inundation maps.

Sec. 22a-411a-2(b)(1)(B)(vi)

Formerly Sec. 22a-409-3(b)(1)(A)(viii)

TH - The evacuation routes should be determined by the local emergency management officials and should not be a requirement of the dam owner when preparing the EAP. If the community already has the evacuation routes established then they could be shown on the limits of potential flooding map.

TH - Evacuations should be limited to the areas within the limits of potential flooding; areas outside the limits of potential flooding with only one access across the flood zone should not be evacuated. Evacuating people who are outside the limits of potential flooding through the flooding zone places them in danger and takes time that should be used to evacuate other people within the limits of potential flooding.

Response

The regulations do not require the owner to issue an Early or Final Warning to residents, determine evacuation routes or make decisions about who gets evacuated or how they will be evacuated, or where shelters will be located.

Once the dam owner notifies the local emergency authority that there is an existing condition at the dam that fits the criteria for an Early Warning or a Final Warning, the

local authorities are responsible for making all decisions regarding emergency response.

The dam owner is responsible for preparing an EAP for each Class C and Class B dam they own and obtaining some basic information required in the EAP regarding decisions made in advance by the local authorities regarding actions they may have to take when responding to a potential or actual dam failure. This is why it is critical that the dam owner, or person writing the EAP begin the process of developing an EAP by involving the appropriate local authorities early to obtain this information and educate them about the dam and the potential hazard the dam poses to downstream residents should the dam fail.

DEEP believes the information required in the EAP is basic and essential information needed in the EAP so the document can be used as a practical and coherent document by anyone.

DEEP recommends no change.

Sec. 22a-411a-2(b)(1)(B)(i)

Formerly Sec. 22a-409-3(b)(1)(B)(i)

Comment

WP - Based on our experience in emergency planning, the estimated time of peak flood waters and the incremental increase in water depth above the baseline elevation at the cross-sections are also important for emergency responders to prioritize their actions. Such information are [sic] standard output of dam breach modeling and therefore should not increase costs of modeling or inundation map development.

Response

DEEP agrees and recommends the following revision:

(1) (B)The following information related to the inundation map shall also be included with the map:

- (i) An estimated timeline that shows arrival times of peak floodwaters expressed in hours and minutes and incremental increase in water depth above the baseline elevation at critical intersection(s), structure(s), or inhabited structure(s).

Sec. 22a-411a-2(b)(2)

Formerly Sec. 22a-409-3(b)(2)

Comment

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WA- Section 22a-409-3(b)(2) goes on to require notification to the local authority when monitoring is initiated. This notification seems unnecessary. It would be more reasonable to require notifications to the local officials when monitoring indicates any issues requiring an Early Warning Notification under paragraph (b)(3)(A). I suggest eliminating the sentence “The owner shall notify the local authority when such monitoring has been initiated by the owner and that a copy of the EAP for said dam is on file with the municipality.”

This change would also apply to the dam monitoring initiation notification flow chart contact requirements in paragraph (b)(5), with suggested wording of its second sentence “The contacts on the flow chart shall be called when an Early Warning Notification is recommended by the owner or operator and when a Final Warning Notification (Evacuation) is recommended to the appropriate local authority.”

Response

DEEP does not agree that the notification to the local authorities is unnecessary when the dam owner or operator begins to monitor their dam. It is beneficial to the emergency official to know that a dam is being monitored so that the emergency official is better able to deploy their resources efficiently.

During a flood warning local authorities are already on alert for the possibility of deteriorating conditions and are preparing for possible emergency situations that can develop quickly. They can better prepare to ensure the safety of residents downstream of a dam if they have a notice from a dam owner or operator monitoring their dam early well before conditions worsen at the dam to the point of creating a need for an emergency evacuation. If the person monitoring the dam waits until the dam is in danger of failing within a few hours, or minutes before contacting the local emergency authority it may be too late to take actions necessary to prevent the loss of life.

DEEP recommends no change.

Sec.22a-411a-2(b)(2)(B)

Formerly Sec. 22a-409-3(b)(2)(B)

Comment

TH - Remote monitoring of weather, pool level, etc. should be used where possible because less personnel is required and traveling to dam sites during severe storm events may not be possible and could be dangerous. Sending personnel to dams during severe storm events is impractical because local roads and bridges may be impassable due to stream flows which are much less than the spillway design floods for Class C and B dams.

Response

DEEP agrees remote monitoring is an excellent option to safely monitor a dam during storm events if purchasing such equipment is feasible for the dam owner. Many dams are privately owned and in some cases dam owners may not be able to afford this option. The person monitoring the dam is responsible for keeping the local emergency authority informed of deteriorating conditions at the dam. They may monitor the dam by being at the site, or remotely if it becomes unsafe for the person monitoring the dam on site by using remote technology.

The regulations require the dam owner or operator to monitor the dam, and walk the crest and inspect embankments, when feasible. The regulations as written allow the person responsible for monitoring the dam the option to choose not to walk the dam crest if the person doing the monitoring determines it is not safe to do so.

However, monitoring begins when a Flood Warning is issued for the area where the dam is located. This early monitoring should give the person monitoring the dam an opportunity to safely assess the condition of the dam well before conditions at the dam begin to deteriorate. By beginning monitoring when a flood warning is issued the dam owner is in a good position to warn local emergency authorities of a possible breach before conditions at the dam deteriorate to the point of becoming a dangerous threat to the person monitoring the dam and to downstream residents.

If at any time the person monitoring the dam feels they may be in danger if they stay on-site and can no longer safely monitor the dam they should report this information to the appropriate emergency authority and leave the area. If the area becomes unsafe for the person monitoring the dam at the dam site, it is likely that downstream residents may have to be evacuated and should be warned by the local emergency authority that an evacuation may be necessary, or is necessary.

DEEP recommends no change.

Sec. 22a-411a-2(b)(2)(C)

Formerly Sec. 22a-409-3(b)(2)(B)

Comment

WP It is unclear as to whom or how the “interval that has been calculated” for the monitoring should be calculated. If such a calculation formula is available, we suggest including it. Alternatively we suggest that the interval at which the monitoring should be conducted should be based on the intensity of the storm, the expected duration of the storm, the relative size of the flows being experienced at the dam and any obvious signs of stress at the dam. The dam owner can seek advice from their listed technical resources or perhaps the CT DEEP Dam Bureau experts for additional assistance in determining the frequency of monitoring needed.

Comment

9/22/ 2015

WA - 22a-409-3(b)(2) indicates “A Dam Monitoring Procedure shall be implemented during periods of heavy rainfall and runoff...” It is unclear whether this means during National Weather Service Flood Watch or Warning as referenced in paragraph (b)(2)(C), or any heavy rainfall and runoff. If the latter, this term should be defined as a NWS Flood Warning,”

Comment

WA- Paragraph (b)(2)(C) requires initiation of monitoring of the dam during both National Weather Service Flood Watches and Warnings. The National Weather Service defines Flood Watch as “Issued to inform the public and cooperating agencies that current and developing hydro-meteorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.” As both 22a-409-3(b)(2) and Public Act 13-197 state dam monitoring is required during (underline added) periods of heavy rain and runoff, it would be more reasonable to require dam monitoring only for actual Flood Warnings. Suggested wording for first sentence of paragraph(b)(2)(C) is “Initiation of monitoring of the dam when the National Weather Service announces a Flood Warning for the area where the dam is located or when other conditions develop that warrant close monitoring.”

Comment

PM - (b) (2) (C) “Initiation of monitoring of the dam when the National Weather Service announces a Flood Watch, or a Flood Warning for the area where the dam is located or when other conditions develop that warrant close monitoring. Said monitoring shall be conducted at an interval that has been calculated to correspond with the particular hydrologic, hydraulic and structural components of the dam.”

Should it only be required for a flood warning as opposed to a flood watch. Suggest adding “at least” before flood warning.

Response

DEEP agrees with suggestion that the interval at which the monitoring should be conducted should be based on the intensity of the storm, the expected duration of the storm, the relative size of the flows being experienced at the dam and any obvious signs of distress at the dam.

DEEP also agrees there should be some guidance regarding the calculation prepared by the professional engineer to correspond with the particular hydrologic, hydraulic and structural components of the dam. DEEP is planning on developing guidance that will address the various computer models for use in inundation mapping as well as pre-breach hydrology.

DEEP also agrees that monitoring and notification of monitoring should start with a Flood Warning rather than a Flood Watch. The regulation will be revised to delete all references to a Flood Watch.

DEEP recommends reorganization and revision to Sec. 22a-411a-2(b)(2)(A) through (C) as follows:

- (2) A dam monitoring procedure that shall outline procedures for monitoring the dam during periods of heavy rainfall and runoff, or when other conditions develop that warrant close monitoring of the dam. At a minimum, the dam monitoring procedure shall provide for the following:
 - (A) The identification of the personnel and their alternate(s) responsible for conducting monitoring of the dam and features of the dam to be inspected at given intervals.
 - (B) The Initiation of monitoring of the dam when the National Weather Service announces a Flood Warning for the area where the dam is located or when other conditions develop that warrant close monitoring. Said monitoring shall be conducted at an interval that has been calculated by a professional engineer retained by the owner, to correspond with the particular hydrologic, hydraulic and structural components of the dam. Such monitoring shall include viewing the dam and, if feasible, walking the dam crest at regular intervals to determine if any sloughing of the embankment, cracking, settlement, or movement of the dam has occurred. This shall also include the inspection of the toe of the dam and the abutment contacts to detect any signs of deterioration of the dam or its components, and inspection of the spillway(s) and outlet structure(s) for accumulations of debris.
 - (C) A notification to the local authority that monitoring under the procedure has been initiated in accordance with the EAP on file with the municipality.

Sec. 22a-411a-2(b)(2)(H)

Formerly Sec. 22a-409-3(b)(2)(H)

Comment:

WP We believe the intent of this requirement is to have the dam owner or operator list what technically qualified resources (i.e. individuals in some cases) would serve to advise the dam owner/operator in determining the mitigation actions that should be taken, and to assist in implementing those actions. We question the appropriateness of suggesting that such resources/individuals, other than the dam owner, would assume the decision responsibility.

Response

The intent of this requirement is to have the dam owner list personnel that he or she will be relying on to make decisions when the dam owner is absent. For example, a private dam owner may live out of state, or have a tenant on the property where the dam is located.

DEEP recommends the following revision:

(b)(2) (H) A list identifying personnel and their alternate(s) that would be utilized by the dam owner or operator(s) responsible for decision making and for implementing emergency repairs, when the owner is absent.

Sec.22a-411a-2(b)(4)

Formerly Sec. 22a-409- 3(b)(4)

Comment

WP - As this location [emergency response center] may change over time or due to event specific conditions, we question the appropriateness of including the location in a dam EAP. Protocols of the emergency response organizations undoubtedly announce this location of the Emergency Response Center(s) which are opened. Listing a location in an EAP controlled by a private dam owner could result in erroneous or outdated information being used.

Response

The location for an emergency response center is not selected by the dam owner. Towns typically have a location pre-selected to be used as an emergency operation center. The dam owner should contact the town officials when developing the EAP to find out from the town the location the town will designate as the emergency action center in the event of an emergency involving the owner's dam.

This is important information to have in the EAP before an emergency occurs and DEEP does not agree that this location changes too often to have it identified in the plan. The regulations require the EAP be updated every two years by the dam owner or more often if necessary. DEEP's experience in reviewing EAPs and subsequent updates has been that information that changes frequently is typically changes in phone numbers, contact names, or titles of contacts.

It is critical that the person writing the EAP meet with the local authorities at the beginning of the development of the EAP to find out from the local authority a variety of important information that is required to be in the plan, such as who the dam owner should contact to notify them he or she has begun monitoring the dam, who they should contact if an Early Warning or Final Warning to downstream residents is recommended, where exactly does the local authority anticipate running the emergency operation center, what are the evacuation routes the local authority will be using in the event failure of the dam is imminent and downstream residents need to be evacuated. These are all critical actions that are typically pre-determined by the local emergency authority.

DEEP recommends no change.

Sec.22a-411a-2(b)(5)

Formerly Sec. 22a-409-3(b)(5)

Comment

WP - Keeping an EAP current is vital in maintaining its usefulness, and the easier it is to keep it accurate the more likely those actions will be taken. Our experience has been that the names of individuals are often changing but the positions do not. Thus, we suggest that individual names not be included on a Notification Flowchart to keep the updating process from being unnecessarily burdensome.

Comment

WP - We question the appropriateness to initiate the calls on the Notification Flowchart whenever a National Weather Service Flood Watch is announced. Such a watch does not mean that there is any danger at any specific dam. Calls made by every dam owner in a Flood Watch area could also quickly overwhelm emergency response organizations that cover an area having a number of dams. Also, this direction appears to conflict with the direction given under Section (3)(A), (B) and (C) which only require flowchart implementation when certain conditions exist at the dam, not whenever a Flood Watch is issued by the National Weather Service.

Comment

WA - Section 22a-409-3(b)(2) goes on to require notification to the local authority when monitoring is initiated. This notification seems unnecessary. It would be more reasonable to require notifications to the local officials when monitoring indicates any issues requiring an Early Warning Notification under paragraph (b)(3)(A). I suggest eliminating the sentence "The owner shall notify the local authority when such monitoring has been initiated by the owner and that a copy of the EAP for said dam is on file with the municipality."

This change would also apply to the dam monitoring initiation notification flow chart contact requirements in paragraph (b)(5), with suggested wording of its second sentence "The contacts on the flow chart shall be called when an Early Warning Notification is recommended by the owner or operator and when a Final Warning Notification (Evacuation) is recommended to the appropriate local authority."

Comment

WP We suggest that the terminology "public utilities responsible for providing emergency services" be clarified. Is this intended to mean emergency response organizations such as fire departments, Emergency Management Directors, State emergency management organizations, etc. to be listed or also local power and gas companies who might be called upon to cut or restore power or cut or restore local gas service?

Response

DEEP agrees that contact names may change often in some situations and titles may be appropriate, and in other situations the contact names do not change often and the contacts don't have titles. Therefore DEEP recommends a revision to allow the dam owner to have the option to choose either names or titles as they deem appropriate.

DEEP agrees that it is more appropriate to initiate monitoring of the dam when a Flood Warning is issued by the National Weather Service, rather than a Flood Watch.

Therefore DEEP recommends a revision to delete all references in the proposed regulation to a Flood Watch and change the requirement to begin monitoring when the National Weather Service announces a Flood Warning.

DEEP does not agree that the first notification to a local authority regarding the dam should be issued when the dam owner decides an Early Warning may be necessary because that means the dam owner is notifying the local authority for the first time when the dam is in danger of possibly failing within a few hours or less.

DEEP feels monitoring should start well ahead of a potential disaster and the owner or operator monitoring the dam should be in contact with the local authorities when a Flood Warning is issued to report on the condition of the dam as a benchmark and continue to evaluate the dam as conditions worsen. This early monitoring is critical to ensure downstream residents can be warned and evacuated in time to ensure their safety should the dam begin to fail.

DEEP agrees the terminology "public utilities" should be clarified. A utility, for example, electric or gas, may be called upon to shut off or restore service during an emergency. DEEP recommends using a statutory definition for a "Public Service Company" the public is already familiar with in place of "public utilities". This definition will be added to Sec. 22a-411a-1(a) and will be incorporated by reference.

The following revision is recommended to Sec. 22a-411a-2(b)(5):

(2)(b)(5) A notification flow chart that shows titles or associated contact names with phone numbers of local, state, federal, tribal agencies, and any public service company as defined in subsection (a) of these regulations, that are responsible for providing emergency services. The contacts on the flow chart shall be called when dam monitoring is initiated in response to a National Weather Service Flood Warning, when an Early Warning Notification is recommended by the owner or operator and when a Final Warning Notification (Evacuation) is recommended to the appropriate local authority. The flow chart shall clearly depict the order and circumstance under which named contacts will be notified.

Sec.22a-411a-2(b)(6)

Formerly Sec. 22a-409-3(b)(6)

Comment

TH - The EAP's distributed to the emergency management officials should be short and concise in PDF format with a file size small enough to email to first responders. The EAP's should be emailed to emergency management officials when the storm warnings are issued so that the officials will have a copy readily available at the time it may be needed.

Response

DEEP does not agree the dam owner should have the burden to provide electronic copies of their EAP every time there is a storm warning. Emergency Officials are responsible for taking copies of the EAPs into the field with them when they are needed. Dam owners may choose to take on the additional burden of sending electronic copies to the local authority each time there is a flood warning, but the DEEP believes it is too burdensome to the dam owner to require repetitive electronic submissions to the local emergency authority each time there is a flood warning.

DEEP agrees EAPs should be short and concise as possible. Having an EAP in PDF format that can be mailed to first responders is a good option and DEEP encourages those dam owners who have the capability to provide an electronic copy of the EAP in a PDF format to do so.

DEEP recommends no revisions.

Sec. 22a-411a-2(b)(8)

Formerly Sec. 22a-409-3(b)(8)

TH - Biennial table top exercises should not be required. Dam owners should meet with emergency management officials when the EAP's are first issued. EAP's should be emailed to emergency management officials annually after that to verify email addresses and update information. Table top exercises are difficult to schedule, time consuming and the probability of needing to put the plan into action is very low.

Response

DEEP agrees that a biennial table top exercise can be difficult to schedule and time consuming. There is no requirement in the proposed regulation for dam owners to conduct biennial table top exercises. Dam owners are given an option of choosing an exercise or test as they see fit. Dam owners can choose to do a phone test, rather than a more involved table top exercise, every two years that involves calling all the contacts which is relatively easy to schedule and implement.

No changes are recommended.

Sec. 22a-411a-2(c), (d), and (e)

Formerly 22a-409-3(c), (d), and (e)

(c) Submission of Emergency Action Plans.

No comments received on this subsection.

(d) Failure to submit EAPs or EAP updates.

No comments received on this subsection.

(e) Incomplete submission.

No comments received on this subsection.

ATTACHMENT 1

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